

CLAIMS(new set of claims under statement of the Art. 19 of the PCT)

1.- Shoe with automatic closure, the shoe being of the type comprising a sole (1) with a toe piece (2) to which is attached at least one front attachment element (4) meant to hold a front part of the foot, and a heel piece (3) to which is connected at least one an upper element (8) susceptible to be driven by the heel of the foot **characterized in that** said upper element (8) moves with its movement to a mobile support (6), to which a rear attachment element (5) is joined, from an open position, where is possible the introduction of the foot, to a closed position, in which the foot remains fixed inside the shoe, and said rear attachment element (5) and the mobile support (6) remain in said close position by the pressure done by the upper element (8) and against elastic means (7, 72, 80, 102, 112, 132, 142, 152, 162) which push to said rear attachment element (5) and mobile support (6) to its open position. The upper element (8) remains in their close position to the mobile support (6) and to the rear attachment element (5) by the indirect action of reversible retaining-realising means (10, 26, 70, 90, 100, 110, 131, 140, 150, 160) which comprise a projecting part susceptible of being pressed by the other foot, releasing the upper element (8) which at the same time releases the mobile support (6) and the rear attachment element (5).

2.- Shoe with automatic closure, according to claim 1, characterized in that the mobile support (6) articulates in its rear part with a lower element (9) which form part of the heel (3), where the joint is performed by the shaft (11), (73), so the mobile support (6) can turn at least a certain angle between the open and close positions and where said mobile support (6) comprises a distal end which is in contact with the upper element (8) through an sliding or rolling contact, being used the above mentioned

shaft (11), (73) by the retaining-realising means (70,131,164)

3.- Shoe with automatic closure, according to claim 2, characterized in that the distal end of the mobile support (6) comprises at least one plug (17) which slides along the grooves (16) which form part of the upper element (8), so the distal end of the mobile support (6) has a sliding movement regarding the upper element (8) without loosing the contact.

4.- Shoe with automatic closure, according to claim 2, characterized in that the relative movement between the upper element (8) and the mobile support (6) is also obtained by mean of a hook (134) placed in the upper element (8) and a window (135) placed in the distal end of the mobile support (6) and through which the hook (134) passes.

5.- Shoe with automatic closure, according to claim 2, characterized in that the upper element (8) articulates in its front part with the lower element by means of a hinge pin (15), having in the open position the maximum distance between the upper element (8) and the lower element (9).

6. Shoe according to claim 5 characterised in that the aforementioned elastic means (7) act on the lever (13) to push the mobile support (6) to the open position and to separate the upper and lower elements (8, 9).

7. Shoe according to claim 6 characterised in that said elastic means (7) comprise a helical or a compression spring.

8. Shoe according to claim 5 characterised in that the upper element (8) includes guide means (16) for the distal end (14) of the lever (13), these guide means restricting the sideways relative motion between the distal end (14) and the upper element (8) and allowing a translation movement of the distal end (14) with respect to the upper element (8).

9. Shoe according to claim 8 characterised in that the aforementioned guide means comprise at least one pair of grooves (16) attached to the upper element (8) or being part of it, in which are slidably inserted corresponding lugs (17) that extend laterally from the distal end (14) of the lever (13).

10. Shoe according to claim 8 characterised in that the distal end (14) is rounded and slides on a contact track (18) of a strong material with a low coefficient of friction with respect to the material of the distal end (14) of the lever (13).

11. Shoe according to claim 3 characterised in that said first retaining-releasing means (10) comprise a trigger (19) with a tab (20), this trigger (19) being mounted on the upper element (8) or lower element (9) so that it is free to turn about a pin (12) and is pushed by a spring (31) towards a retaining position where said tab (20) engages an anchoring (21) provided in the opposite lower element (9) and upper element (8) when the mobile support (6) is in the closed position.

12. Shoe according to claim 10 characterised in that the trigger (19) includes a surface (22) that can come in contact with a surface (23) of the anchoring (21), these surfaces (22, 23) being configured and arranged so that the trigger (19) is displaced by the surface (23) against the action of the spring (31), while the upper element (8) and the lower element (9) approach each other to allow the anchoring (21) to pass in front of the aforementioned tab (20), and the trigger (19) is released when the mobile support (6) reaches the closed position to allow coupling the tab (20) in the anchoring (21).

13. Shoe according to claim 11 characterised in that the trigger (19) comprises a protrusion (24) that can be accessed from the outside and that can be actuated by the user when the mobile support (6) is in the closed position to move the trigger (19) against the

action of said spring (31) in order to release the coupling of the tab (20) in the anchoring (21) and allow the mobile support (6) to move to the open position by the elastic means (7).

14. Shoe according to claim 12 characterised in that the anchoring (21) mounted on the upper element (8) or the lower element (9) has inclined side ends (47) that in the closed position are inserted in the inclined walls (37) of a cavity that exists in the opposite lower element (9) or upper element (8) where the trigger (19) is housed.

15. Shoe according to claim 2 characterised in that the first retaining means comprise elastic means (25) that act on the mechanism to push the mobile support (6) to the closed position and said second retaining means (26) retain the mobile support (6) in the open position against the action of the elastic means (25), the second retaining means (26) being configured and arranged in relation to the upper and lower elements (8, 9) so that when the upper element (8) is pressed on by the heel of the user's foot to bring it near the lower element (9), the aforementioned second retaining means (26) are released and with them the aforementioned mobile support (6) moves to said closed position by the action of the elastic means (25).

16. Shoe according to claim 14 characterised in that the mobile support (6) can be displaced by the user from the closed position to the open one against the action of the elastic means (25), during which displacement the upper and lower elements (8, 9) are separated or allowed to separate until the second retaining means (26) are automatically placed in a retaining position for the mobile support (6) in the open position.

17. Shoe according to any of claims 2 to 4 characterised in that the upper element (8) is joined to said toe piece (2) of the sole (1) and the lower element (9) moves downward with respect to it.

18. Shoe according to claim 4 characterised in that the mobile support (6) is connected to the lower element (9) by linear displacement guides and a lever (38) is hinged on an end (39) to the upper element (8), and mounted on the opposite end is at least one gear wheel (40) that engages on diametrically opposite areas the two racks (41, 42) respectively attached to the mobile support (6) and the lower element (9).

19. Shoe with automatic closure, according to claim 2, characterised in that the hinge between the upper element (8) and the lower element (9) is established by a front hinge (75), while the hinge between the upper part (8) and the mobile support (6) that is connected to the rear attachment element (5) is established by a central shaft (74); in addition, said mobile support (6) is hinged to the lower element (9) by the rear shaft (73), this rear shaft (73) also hinging the retaining-releasing element (70) to the lower element (9).

20. Shoe with automatic closure, according to claim 2, characterised in that the retaining-releasing means (70) for keeping the rear attachment element (5) in a closed position are provided with an actuation tab (71) that by pressing against the action of a spring (79) and revolving about the rear shaft (73) moves the tab (78) and releases the rear part (77) of the upper element (8), raising it by elastic means.

21. Shoe with automatic closure, according to claim 2, characterised in that the releasable retaining means for the open position consist of an elastic element (76) disposed on the front pivoting shaft (75) between the upper element (8) and the lower element (9).

22. Shoe with automatic closure, according to claim 2, characterised in that the releasable retaining means for the open position consist of an elastic means (72) disposed vertically between the lower piece (9) and the upper piece (8).

23. Shoe with automatic closure, according to claim 2, characterised in that the releasable retaining means for the open position consist of an elastic means (80) which when compressed acts pushing back the central shaft (74).

24. Shoe with automatic closure, according to claim 2, characterised in that regardless of the shape of the releasable retaining means for the open position used, the central shaft (74) runs through an oblong orifice (81) through which slides said shaft (74) by the action of the releasable elastic retaining means for the open position.

25. Shoe with automatic closure, according to claim 24, characterised in that alternatively to the upper part (8) having an oblong orifice (81) through which the central shaft runs, it is provided on its sides with corresponding lugs (82) that are housed in elongated or oblong orifices (85) made in the mobile support (6) such that they allow a hinged union of the mobile support (6) and the upper element (8), the lateral lugs (81) of the upper element (8) sliding in said oblong orifice (83).

26. Shoe with automatic closure, according to claim 2, characterised in that the rear attachment element (5) is provided with an orifice on each of its sides in which is hinged a hinged part (84) of the front part (4), this front hinged part (84) being joined to the rear attachment element (5) by a hinge (86); in addition, the hinged part (84) is also provided with a degree of freedom in its union to the front part (4) through the hinge area (85).

27. Shoe with automatic closure, according to claim 26, characterised in that the hinged part (84) as shown can be configured in the form of a belt that runs from side to side under guides, and is retains in the hinges (86) so that when the assembly is closed when the hinge

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(86) moves down it pulls on the belt pressing on the upper and improving its hold.

28. Shoe with automatic closure, according to claim 26, characterised in that the rear attachment element (5) is provided with hinging means (86) to the front part (4) so that the two parts are directly hinged without needing additional elements.

29. Shoe with automatic closure, according to claim 1, characterised in that the retaining-releasing means (90) are placed on the rear end of the upper element (8) anchored on an incut (93) defined in the lower element (9), with the hinge of the rear attachment element (5) and the upper element (8) above it.

30. Shoe with automatic closure, according to claim 1, characterised in that the retaining-releasing means (100) actuated by the trigger (101) is joined to the sole or to the lower element, the rear retaining element (5) having an arm (103) on which acts the elastic means (102) to keep it in this position.

31. Shoe with automatic closure, according to claim 1, characterised in that the retaining-releasing means (110, 120) when acting on the trigger (111, 121) move an element (133, 123) that releases a hook (115, 125) joined to the upper element (8).

32. Shoe with automatic closure, according to claim 1, characterised in that there is no central shaft on the upper element (8), being provided with retaining-releasing means (130) actuated by a trigger (131), so that joined to the lower part of the upper element (8) is an additional element (132) that does not require a central hinge.

33. Shoe with automatic closure, according to claim 1, characterised in that between the upper element (8) and the rear attachment element (5) a gearwheel is provided by the support to which it is joined, such that the friction in said joint is greatly reduced.

34. Shoe with automatic closure, according to claim 1, characterised in that the means for keeping the assembly in the open position (152) are based on using elastic means such as rubber or the like.

35. Shoe with automatic closure, according to claim 1, characterised in that the means for keeping the assembly in the open position are based on using a flexible area (162) in the union between the upper element (8) and the lower element (9).

36. Shoe with automatic closure, according to claim 1 or 44, characterised in that the retaining-releasing means (160) are provided with a flexible area (163) at its union to the lower element (9) forming a single piece.

37. Shoe with automatic closure, according to claim 1 or 45, characterised in that the mobile support (6) is provided at its union with the lower element (9) with a flexible area (166) forming a single piece.

38. Shoe with automatic closure, according to claim 1 or 46, characterised in that the mobile support (6) is also provided at its front area with a flexible retaining area (167).

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~~anchored on an incut (93) defined in the lower element (9), with the hinge of the rear attachment element (5) and the upper element (8) above it.~~

5 39. Shoe with automatic closure, according to claim 1, characterised in that the retaining-releasing means (100) actuated by the trigger (101) is joined to the sole or to the lower element, the rear retaining element (5) having an arm (103) on which acts the elastic means (102) to keep
10 it in this position.

40. Shoe with automatic closure, according to claim 1, characterised in that the retaining-releasing means (110, 120) when acting on the trigger (111, 121) move an element
15 (133, 123) that releases a hook (115, 125) joined to the upper element (8).

41. Shoe with automatic closure, according to claim 1, characterised in that there is no central shaft on the
20 upper element (8), being provided with retaining-releasing means (130) actuated by a trigger (131), so that joined to the lower part of the upper element (8) is an additional element (132) that does not require a central hinge.

25 42. Shoe with automatic closure, according to claim 1, characterised in that between the upper element (8) and the rear attachment element (5) a gearwheel is provided by the support to which it is joined, such that the friction in said joint is greatly reduced.

30 43. Shoe with automatic closure, according to claim 1, characterised in that the means for keeping the assembly in the open position (152) are based on using elastic means such as rubber or the like.

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44. Shoe with automatic closure, according to claim 1, characterised in that the means for keeping the assembly in the open position are based on using a flexible area (162) in the union between the upper element (8) and the lower element (9).

45. Shoe with automatic closure, according to claim 1 or 44, characterised in that the retaining-releasing means (160) are provided with a flexible area (163) at its union to the lower element (9) forming a single piece.

46. Shoe with automatic closure, according to claim 1 or 45, characterised in that the mobile support (6) is provided at its union with the lower element (9) with a flexible area (166) forming a single piece.

47. Shoe with automatic closure, according to claim 1 or 46, characterised in that the mobile support (6) is also provided at its front area with a flexible retaining area (167).